E–IMPLEMENTATION: A TIME-BASED APPROACH TO EXTRACTING VALUE FROM E-BUSINESS

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"Too many stores….get up a nice web site. They get people interested in their products, but haven't thought about how they are going to get their products to their customers. Even when they…got online orders right, there was a 75% chance that goods wouldn't arrive on time."

This observation was made by "Time Magazine" in December 1999. Recent experiences of the author further confirm that the dream of e-commerce is in some areas an e-nightmare. For example, an attempt to order car catalogues from five of the leading automotive manufacturers through their web-sites resulted in no response from two manufacturers, one organisation sent a catalogue for the wrong model, another sent a letter saying they did not know what catalogue was requested and would therefore send details of their complete model range (which, incidentally, never arrived). Only one organisation sent the catalogue requested.

Booking airport parking online also resulted in a less than satisfactory outcome. After completing the web form and submitting it, receiving an email with a booking number, I was then contacted by telephone for payment. I was then requested to give my name and full address again, details of my flights and given a new booking number since I was told the email booking number was not valid. I asked why I had to re-confirm all this information and was told that information became corrupted and had to be put into a different system.

Are my experiences atypical? I don't think so.

These examples demonstrate that the process responsible for responding to the customer is less than effective. Within many organisations this is the result of attempting to bolt a new e-process onto the existing non-e-process.

When looking for opportunities to implement e-business solutions it is important to be customer driven and not technology driven. Many

organisations, in their eagerness to jump on the e-business bandwagon, forget the customer and become obsessed with the clever technology. This can be detrimental to customer service and result in costly implementations that have little benefit to the organisation.

A simple methodology proving useful with e-business has been developed by the author which, when applied, ensures that e-business processes benefit the organisation both in terms of gaining operational benefits and also service benefits. It is based on time compression/time based mapping techniques that have produced significant benefits for many organisations, from SME's to large multi-nationals, over the past few years. Figure 1 depicts the methodology.

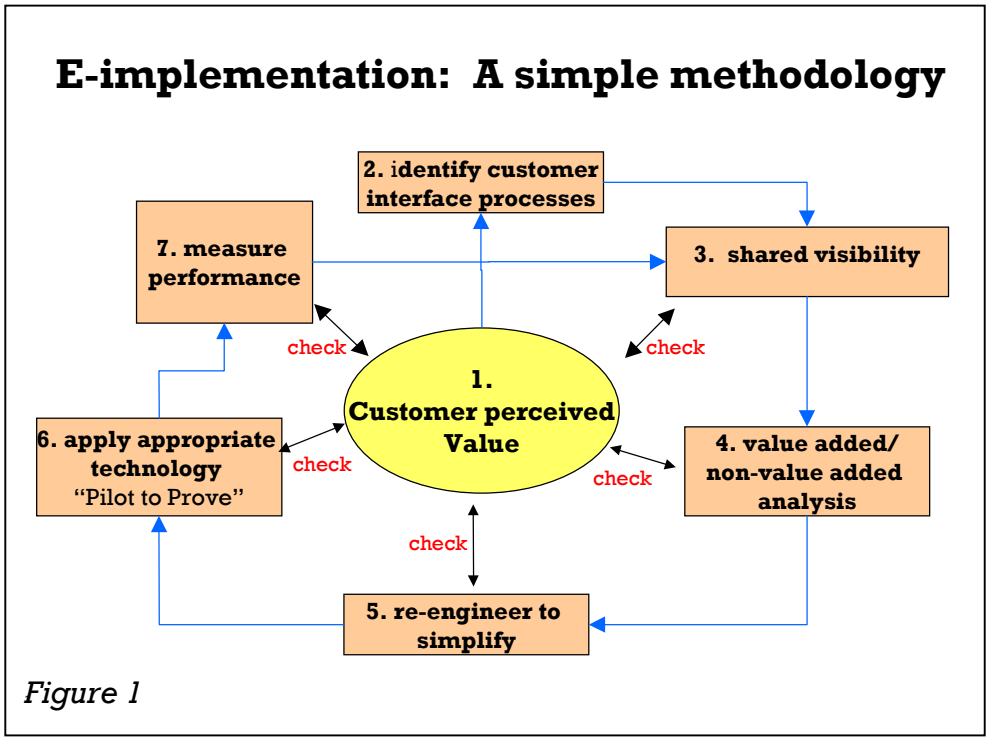

Figure 1

Step 1 – Customer Perceived Value

To compete effectively through e-business an organisation needs to identify what the customer-perceived value of the product or service they offer is. All the processes that support the creation, production and distribution of goods and services must be centred on the customer-perceived value of products. To achieve this companies need to know a

great deal about individual customers and interact routinely and intensively with them. This sounds like common sense but too often people will sit discussing projects based on "My perception of the value of a product or service". This often does not relate to the customer's perception of the value. The marketing and sales department have an important part to play in this but every employee should interact with customers and ask the right questions of customers. When was the last time you actually talked to a real customer? Organisations like Pepsi insist every employee goes on a delivery truck once a year to meet real customers. Cadburys used to insist their senior management spent a day a month on a delivery truck. This gives those in the organisation a greater understanding of the customer perception of what they do.

Every step in the methodology uses the Customer Perceived Value as a check to ensure alignment on the customer.

Step 2 – Identify Customer Interface Processes

The customer interface processes are all the processes which have a direct link to the customer. With the changing nature of businesses these are increasing. Traditionally a supermarket may have only one customer interface process, that of the retail shop. Today a supermarket has loyalty cards, customer enquiries, insurance services, credit cards, petrol stations etc. - these provide new opportunities for the customer to interface with the organisation. The importance of these cannot be over emphasised. The poor operation of non-core customer interface processes can loose business. I recently had a conversation with a journalist who had just stopped shopping at a leading supermarket because she had tried on four occasions over the last six months to sort out a problem with a loyalty card using the automatic telephone system and failed. For the sake of less than £5 of vouchers the supermarket is going to lose approximately £6000 per annum of turnover! The accounts department may also have to interface with customers about account enquiries; is this customer interface process responsive? Does the accounts department have the skill and resources to deal adequately with customers? If they don't they could lose you business.

Step 3 – Shared Visibility

Once a process is visible it can be re-engineered and possibly automated by electronic methods. When the customer interface processes are identified the complete process needs to be visible to all in the organisation. Time based mapping techniques have proved particularly effective in achieving high levels of process visibility. The

purpose of time-based process mapping is to generate visibility of the processes within the supply chain. Once this visibility has been achieved it is possible to benchmark similar processes. The processes we need to see are the "actual" processes that take place not the "theoretical" processes. It is not uncommon for quality standards to require the documentation of processes e.g. ISO 9000, but within the organisation the actual process undertaken can differ considerably. When undertaking a supply chain mapping exercise it is the actual process that we need visibility of. The key is to track one order, product, person through the process with respect to time. Traditional mapping methodologies are often only concerned with the key operations. For example, the process for a bookshop processing an order may look like this within a traditional map:

- **John fills in order in book shop.**
- **Jane reviews information and inputs into system.**
- **Phil assigns a customer account number ……etc.**

When one maps the process with respect to time it will look like this:

- **John fills in order in bookshop.**
- **Moved to briefcase.**
- **Waited in briefcase.**
- **Faxed to mail room.**
- **Placed in internal mail**
- **Jane reviews information and inputs into the system.**
- **Waited in an in-tray.**
- **Phil assigns a customer account number.**
- **Input onto system …..etc**

"Walking the Process" in this way maintains visibility of the key operations, however the sub-processes, which often consume time and generate inefficiencies, are also revealed. This then enables solutions to problems to be generated and the process to be improved. Simple maps

rather like Gantt charts can be used to represent the time-consumption of the process.

Step 4 - Value Added/Non-Value Added Analysis

Distinguish between value adding and non-value adding time. A rough definition of value adding time is a time when something takes place on the item that the end customer is willing to pay for. It should be emphasised that defining added value time requires much debate within the organisation and should be aligned with the overall business strategy. The business strategy should define the markets that organisations operate in, the order qualifiers and order winners for those markets can be defined and consequently the customer perceived value of the product or service is identified. Once an understanding of the value adding criteria at the strategic level has been defined it can be translated into value adding criteria at an operational level. The time data collected in stage 3 can then be analysed to identify the value adding time.

Value adding time is characterised using three criteria:

- Whether the process (or elements of the process) is physically changing the nature of the information or customer's product).
- Whether the change to the information or product produces something that the customer values or cares about and may be willing to pay for.
- Whether the process is right first time, and will not have to be repeated in order to produce the desired result that is valued by the customer.

Non-value adding activity can be split into three categories: queuing time, rework time and time wasted due to management indecision. One does not need to be to concerned with the precise application of the definitions, because research shows that generally 95% of the time is non-value adding and therefore there is plenty of improvement to go for!

Step 5 – Re-Engineer to Simplify

With visibility of the process and recognition of the value adding and non-value adding stages the process can now be re-engineered. Simplify the process as much as possible; applying technology to cumbersome, over complex processes rarely results in operational and value advantages being gained. Remember that trying to re-engineer the process after you have applied an electronic solution will cost

approximately 300% more than applying the electronic solution after appropriate re-engineering of the process has taken place.

Step 6 – Apply Appropriate Technology

With our simplified and re-engineered process it is now possible to apply appropriate technology. This could be as simple as an email system or website or could involve far larger enterprise wide solutions. Where possible ''Pilot to Prove''. Try to pilot the solution first. A small implementation to prove the feasibility of future projects will save money and also speed up implementation of the larger system because it can be used to get buy-in from those involved in the process.

Step 7 – Measure Performance

It has been said ''If you are not measuring it, you are only practising''. To compete and play the game effectively the organisation must measure all processes. Often organisations attempting to improve the management of the processes overlook the new information requirements that are generated. Measures need to be in place that address our systems performance and our people performance. The effectiveness of people using the technology needs to be measured and also the effectiveness of the system. The people interfacing with the technology could be customers, so make sure measures are in place that focus on the ease with which customers relate to the system. Within e-business time-based performance measures are particularly important. For example the following measures have proved useful in some environments:

- **Time lost waiting for decisions**
- **Time from idea to market**
- **Percentage deliveries on time**
- **Time from customers recognition of need to delivery**

Step 8 – Back to Step 3

The cycle should never end, once the process has been re-engineered and appropriate technology implemented one needs shared visibility of the new process again and the desire to improve things further!

By following the above simple methodology organisations can reduce the chance of failure with e-business implementations and also gain operational advantage and value advantage by aligning their systems

with the "Customer Perceived Value" of the services and products they offer.

CASE STUDY

Precision Gauges Inc. (the name has been changed to protect the innocent!)
Precision Gauges Inc. is a world leading company manufacturing measurement devices that measure to 5 microns (0.005mm). These are used by all engine manufacturers during their manufacturing processes and they are used for lawn mower engines to Formula 1 engines. Each gauge is a "one off" manufactured for a specific task.

Time-based methods are used to identify where e-business applications could be applied within their organisation. One critical process reviewed was the product design and manufacture process. This Customer Interface Process involved a large number of activities to be undertaken by them and their customer. Precision Gauges "walked the process" and the result is shown in Figure 2.

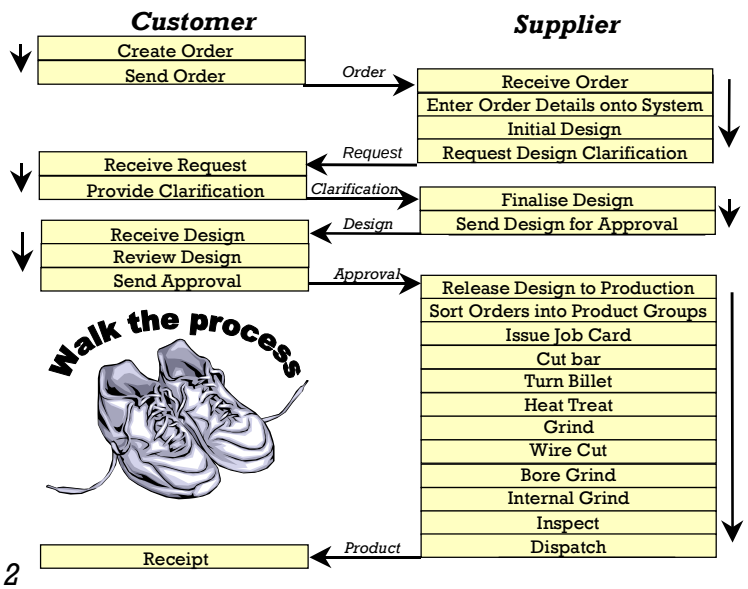

Figure 2

The value adding and non-value adding time (or wasted time and activity time as Precision Gauges preferred to call it) was then identified. Figure 3 depicts this analysis which revealed only 10% of the process lead-time was activity time. The time-based process map shows the total lead-time of 8.5 weeks. A workshop was then undertaken by the key members of staff involved in the process and the causes of non-value added time identified. These included:

- Customer/supplier interface – surface mail was used when passing information.
- The customer provides drawings in paper format that have to be converted to electronic format.
- Each group has its own drawing resulting in conflicts within the information held.
- Each machine in the process requires complex programming.
- Transcription errors and re-work were common within the organisation.

Organise Data into a Time Based Process Map

Process Steps	Wasted Time /Working Days	Activity Time /Working Days
Receive Order	1.00	0.00
Initial Design	9.50	0.50
Clarify Design	2.00	0.03
Finalise Design	0.25	0.25
Approve Design	0.50	0.06
Issue Job Card	0.50	0.01
Cut Bar	1.00	0.13
Turn Billet	10.00	0.03
Heat Treat	1.50	2.50
Grind	0.13	0.01
Wire Cut	5.00	0.13
Grind Bore	2.00	0.06
Grind Internal	1.50	0.50
Inspect	1.50	0.02
Dispatch	2.50	0.13
Total time	**38.88**	**4.35**
% of total time	90 %	10 %

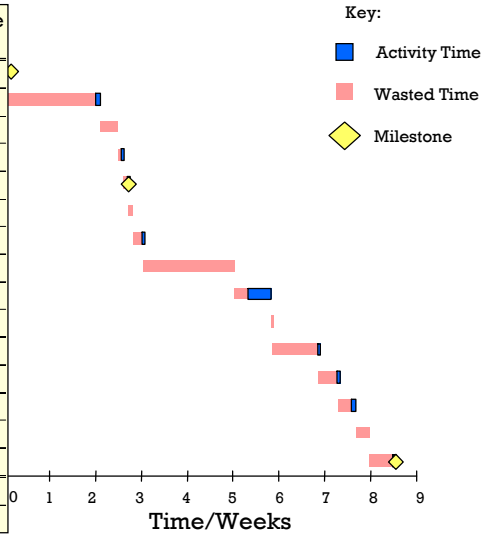

Figure 3

It was recognised by Precision Gauges that the introduction of internet based information and communication technologies into the business could solve many of the problems. A three phase project was used. Phase 1 being a "Pilot to Prove"; Phase 2 focusing on communicating with customers and understanding the customer perceived value of their plans; Phase 3 involved full implementation. The detailed steps and costs are shown below.

Phase 1: Investigation and Training

- Install a single PC with Internet software and modem (cost £1000).
- 2 days of staff training for 5 people (cost £700).

Phase 2: Communicate Externally

- Exchange e-mail with customers.
- Use customer drawing data received in e-mail file attachments as the basis for component design.

Phase 3: Communicate Internally

- Train further 35 people in email and web browser (half company staff) (£1.5K).
- Invest in 15 PCs, software and internal network (£20K).
- Single electronic data source linked to all machines/groups. Used to program machines etc.

Figure 4 shows the new time-based analysis and the map. The immediate benefits to the organisation are as follows:

- Lead-time reduction from 8 weeks to 6 weeks.
- Delivery reliability - dates achieved without overtime.
- Scrap rates down.
- Design costs slashed by 50%.
- Design bottleneck removed, capacity increased.

Time-Based Process Map After E-implementation

Process Steps	Wasted Time / Working Days	Activity Time / Working Days
Receive Order	0.00	0.00
Initial Design	1.00	0.50
Clarify Design	0.50	0.03
Finalise Design	0.25	0.25
Approve Design	0.50	0.06
Issue Job Card	0.50	0.01
Cut Bar	1.00	0.13
Turn Billet	10.00	0.03
Heat Treat	1.50	2.50
Grind	0.13	0.01
Wire Cut	5.00	0.13
Grind Bore	2.00	0.06
Grind Internal	1.50	0.50
Inspect	1.50	0.02
Dispatch	2.50	0.13
Total time	**27.88**	**4.35**
% of total time	86.5%	13.5 %

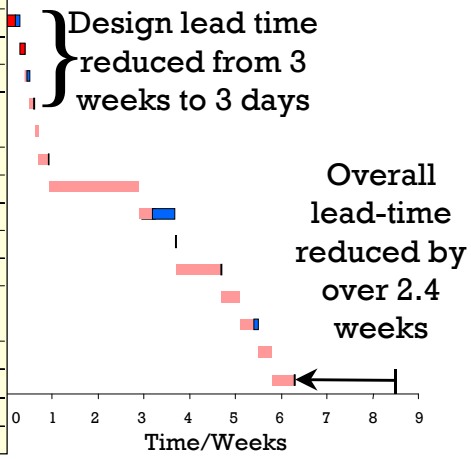

Figure 4

The long term benefits included giving customers increased choice, the organisation could either supply in a shorter lead-time or do more value added work for the customer in the same time by exploring more design alternatives. The increase in capacity resulted in the company being able to do more business. The increased responsiveness of the organisation and the exploitation of the more effective design process has grown the Formulae 1 market from £50K to £1M in 2 years.

Finally Precision Gauges received one of the rarest complements of all, a "love letter" from a customer. A large multi-national customer presumed the company had been expediting their jobs and wrote a letter to thank the company for this special treatment not realising this was now business as usual for Precision Gauges.

This effective e-implementation project has paid for itself many times over!

The author would like to acknowledge Dr. Paul Chapman, Cranfield School of Management for providing the data used in this case study.

Dr Richard Wilding *works with leading European and international companies from a variety of industries on supply chain re-engineering projects. His Doctoral research applied chaos and complexity science to logistics systems and resulted in the development of new management guidelines for supply chain re-engineering. This innovative research received international media coverage including features on the BBC World Service and articles in the Times, Financial Times and New Scientist.*

Richard continues to undertake international lecturing and consultancy assignments in locations as diverse as Hong Kong, India, Poland and Italy. He has published widely in the area of logistics and is Editorial Advisor to a number of leading journals in the area.

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